

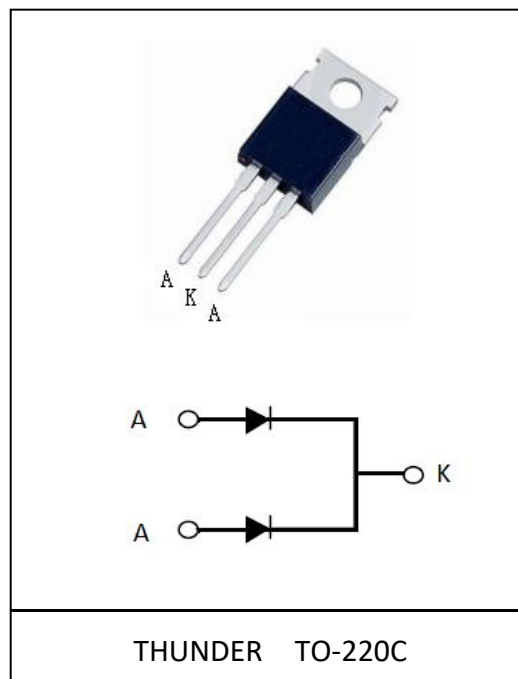
## FRED

### Ultrafast Soft Recovery Diode, 20A

**Features:**

- Ultrafast Recovery
- 175°C operating junction temperature
- High frequency operation
- Low power loss, less RFI and EMI
- Low  $I_R$  value
- High surge capacity
- Epitaxial chip construction

| Product Summary |       |
|-----------------|-------|
| $V_R$           | 400 V |
| $I_{F(AV)}$     | 2*10A |
| $t_{rr}$        | 21ns  |


**Description/Applications**

These diodes are optimized to less losses and EMI/RFI in high frequency power conditioning system. The soft recovery behavior of the diodes offers the need as snubber in most applications. These devices are ideally suited for HF welding power converters and other applications where the switching losses are not significant portion of the total losses.

**Absolute Maximum Ratings**

| Parameter                          | Symbol      | Test Conditions           | Values      | Unit             |
|------------------------------------|-------------|---------------------------|-------------|------------------|
| Repetitive peak reverse voltage    | $V_{RRM}$   |                           | 400         | V                |
| Continuous forward current         | $I_{F(AV)}$ | $T_c = 110^\circ\text{C}$ | 20          | A                |
| Single pulse forward current       | $I_{FSM}$   | $T_c = 25^\circ\text{C}$  | 120         |                  |
| Maximum repetitive forward current | $I_{FRM}$   | Square wave, 20kHz        | 40          |                  |
| Operating junction                 | $T_j$       |                           | 175         | $^\circ\text{C}$ |
| Storage temperatures               | $T_{stg}$   |                           | -55 to +175 | $^\circ\text{C}$ |

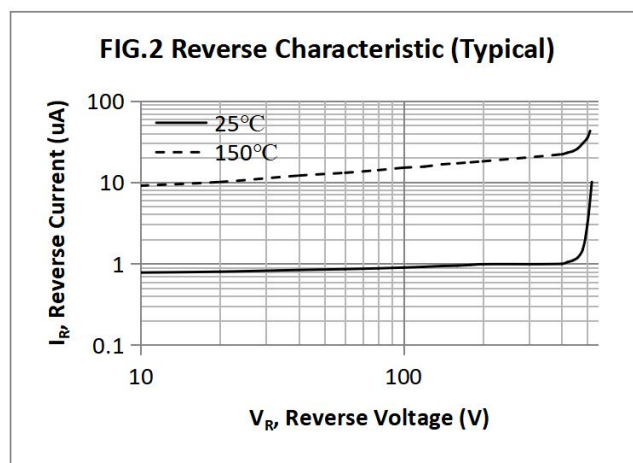
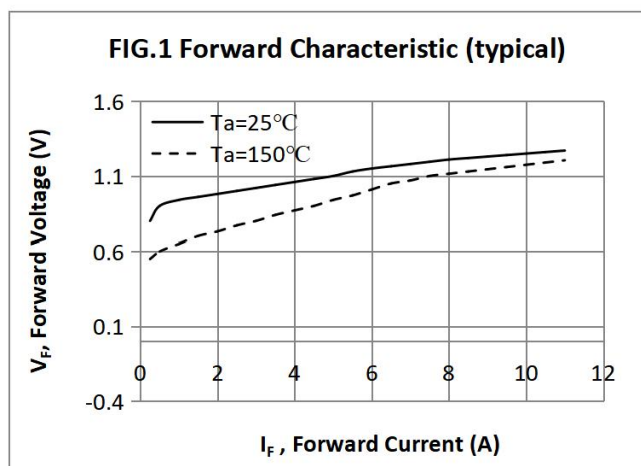
### Electrical characteristics (Ta=25°C unless otherwise specified)

| Parameter                             | Symbol              | Test Conditions                   | Min. | Typ. | Max. | Unit    |
|---------------------------------------|---------------------|-----------------------------------|------|------|------|---------|
| Breakdown voltage<br>Blocking voltage | $V_{BR}$ ,<br>$V_R$ | $I_R=100\mu A$                    | 400  |      |      | V       |
| Forward voltage<br>(Per Diode)        | $V_F$               | $I_F=10A$                         |      | 1.20 | 1.50 |         |
|                                       |                     | $I_F=10 A, T_j =125^{\circ}C$     |      | 1.10 | 1.40 |         |
| Reverse leakage<br>current(Per Diode) | $I_R$               | $V_R= V_{RRM}$                    |      |      | 10   | $\mu A$ |
|                                       |                     | $T_j=150^{\circ}C, V_R=400V$      |      |      | 100  |         |
| Reverse recovery<br>time(Per Diode)   | $t_{rr}$            | $I_F=0.5A, I_R=1A, I_{RR}=0.25A$  |      | 30   | 40   | ns      |
|                                       |                     | $I_F=1A, V_R=30V, di/dt =200A/us$ |      | 21   | 35   |         |

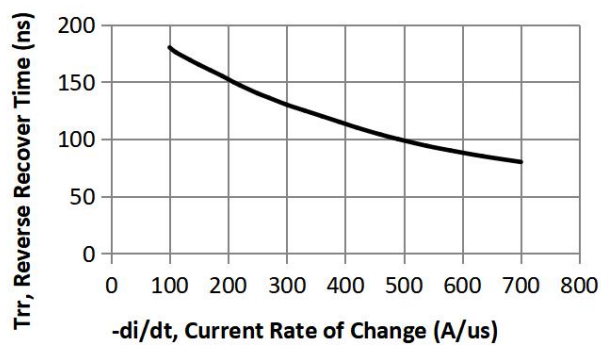
### Thermal characteristics

| Paramter         | Symbol          | Typ. | Unit          |
|------------------|-----------------|------|---------------|
| Junction-to-Case | $R_{\theta JC}$ | 4.2  | $^{\circ}C/W$ |

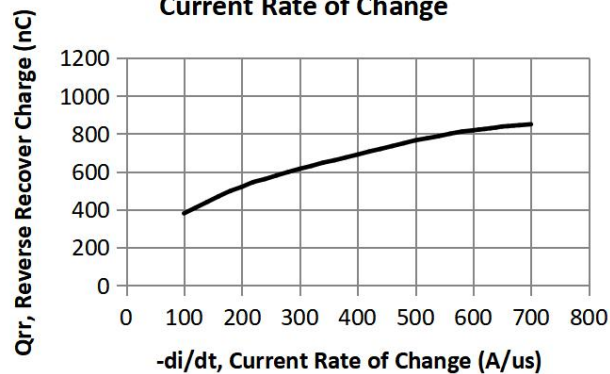
### Electrical performance (typical)



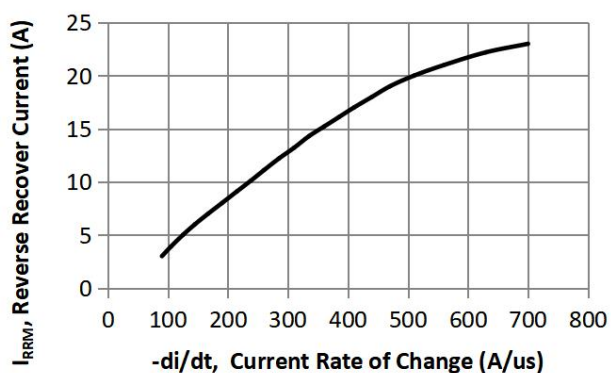
**FIG.3 Reverse Recover Time vs. Current Rate of Change**



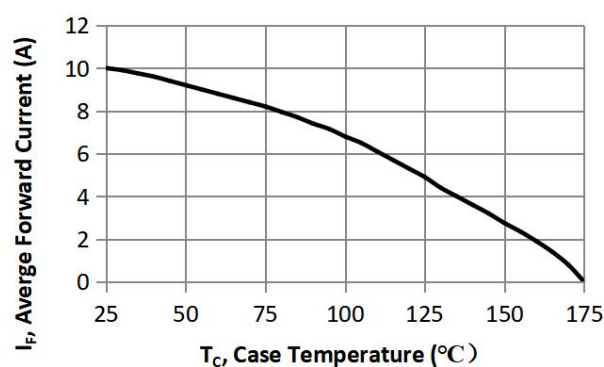
**FIG.4 Reverse Recover Charge vs. Current Rate of Change**



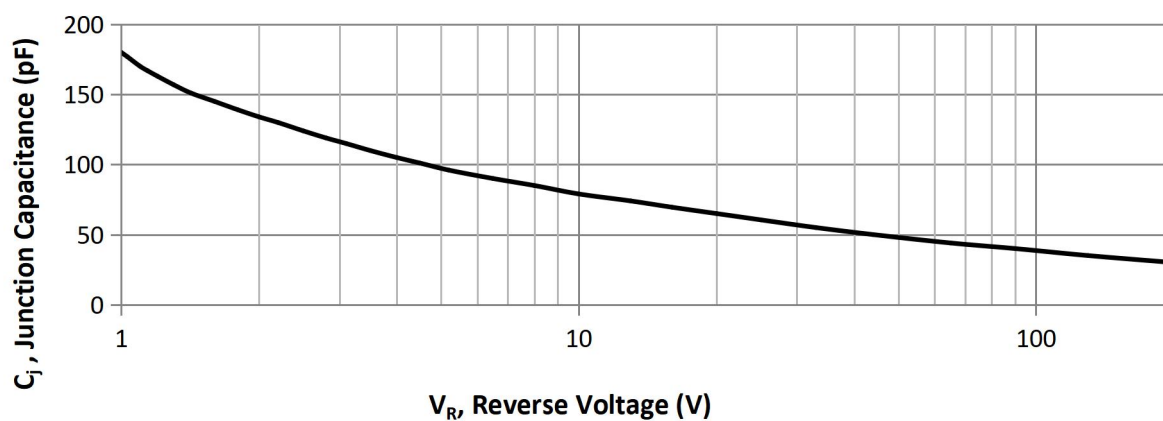
**FIG.5 Reverse Recover Current vs. Current Rate of Change**



**FIG.6 Average Forward Current vs. Case Temperature**



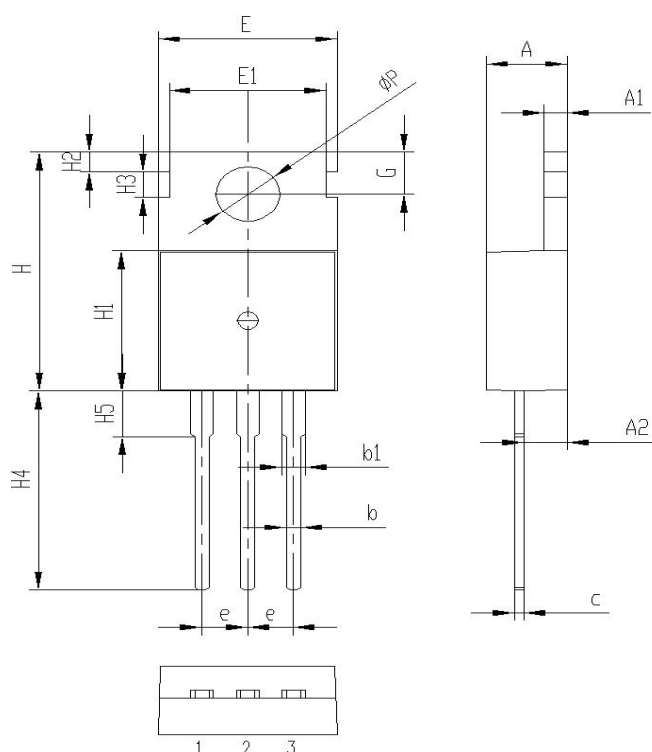
**FIG.7 Junction Capacitance vs. Reverse Voltage**



## Package Information

### TO-220C PACKAGE

#### 基本尺寸



| Symbol   | 单位 mm |      |      |
|----------|-------|------|------|
|          | Min   | Nom  | Max  |
| A        | 4.30  | 4.5  | 4.70 |
| A1       | 1.20  | 1.30 | 1.40 |
| A2       | 2.20  | 2.4  | 2.60 |
| b        | 0.60  | 0.8  | 1.00 |
| b1       | 1.20  | 1.30 | 1.40 |
| c        | 0.40  | 0.5  | 0.60 |
| e        | 2.44  | 2.54 | 2.64 |
| E        | 9.80  | 10.0 | 10.2 |
| E1       | 8.50  | 8.70 | 8.90 |
| H        | 15.5  | 15.7 | 15.9 |
| H1       | 9.00  | 9.2  | 9.40 |
| H2       | 1.10  | 1.34 | 1.50 |
| H3       | 1.50  | 1.7  | 1.90 |
| H4       | 12.9  | 13.3 | 13.7 |
| H5       | 2.80  | 3.0  | 3.20 |
| G        | 2.60  | 2.8  | 3.00 |
| $\Phi P$ | 3.40  | 3.6  | 3.80 |

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